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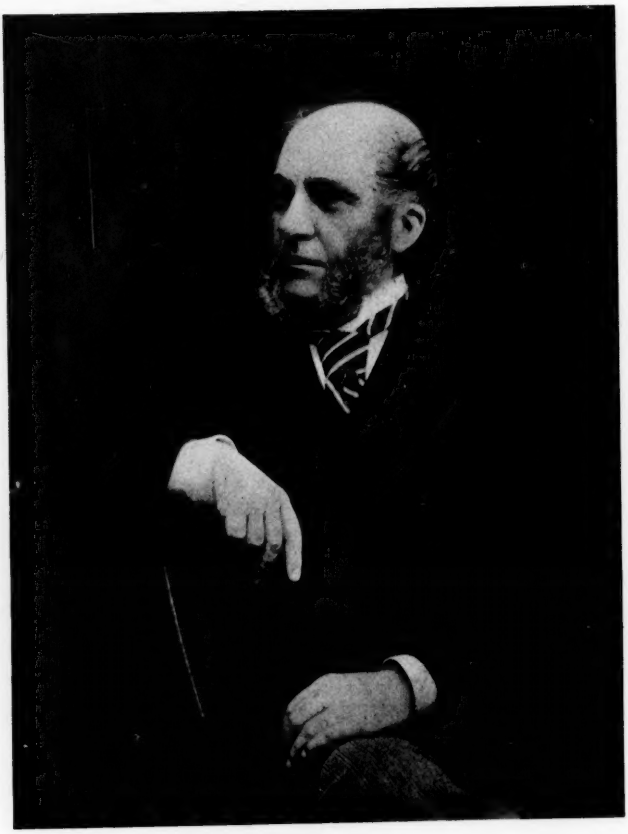

George Whitefield

(1817—1882)

THE BRITISH JOURNAL

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COMMUNICATIONS

BRITISH MASTERS OF OPHTHALMOLOGY SERIES

14.—GEORGE CRITCHETT, F.R.C.S., 1817–1882

BY

A. MAITLAND RAMSAY,

PRESIDENT OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM

THIS brief biographical sketch is offered in respectful memory of George Critchett, and to recall the important part he played at the birth of modern Ophthalmology. The writer is indebted to Sir Anderson Critchett for much of the information here set forth.

George Critchett was born in London on March 25, 1817. He was educated at a private school in Highgate. The story of his boyhood throws no light on what determined him to adopt medicine as a career, but at the age of seventeen he was apprenticed to Mr. John Scott, a well-known surgeon of the London Hospital. He enrolled as a medical student at the London Hospital, where his great capacity for work brought him at once to the notice of his teachers. He became a member of the Royal College of Surgeons in 1839, and shortly afterwards was appointed Demonstrator of Anatomy at the London Hospital.

From the commencement of his medical career he was attracted to the study of Diseases of the Eye, and he attended Moorfields Hospital, where he came under the influence of Tyrrell and Dalrymple, who at that time were the leading ophthalmic surgeons

in London. In 1844, an election of assistant surgeon was held at Moorfields. The appointment was gained by Mr. James Dixon, but the governors were so much impressed by Critchett's testimonials, as well as by their knowledge of his work while a student, that they created an additional post to which they elected him. His colleagues at the time of his appointment to the medical staff were Mr. John Scott, Mr. Gilbert Macmurdo, F.R.S., and Mr. John Dalrymple, F.R.S., in addition to Mr. James Dixon. His foot was now firmly placed on the ladder, and the sterling value of his work, and the rapidity of his success thoroughly justified the governors in making a special appointment in his favour.

The Fellowship of the Royal College of Surgeons was instituted about this time, and of those elected to an Honorary Fellowship was William Bowman, who was then an assistant surgeon at King's College Hospital. Critchett was not one of those chosen, because at that time special hospitals were not held in high favour, and his appointment of assistant surgeon at Moorfields was not considered of sufficient importance to entitle him to the Honorary Fellowship, Nothing daunted, however, he was one of a band of 23, who went up for the first examination for the Fellowship, and was among the eight successful candidates, seven of whom it is worthy of note were demonstrators of anatomy, and two of them Henry Lee and Luther Holden, afterwards became well-known surgeons.

In 1846, Critchett was a candidate for the post of assistant surgeon at the London Hospital. In those days the appeal was made not to a selection committee but to the whole body of governors. After a very keen contest, Critchett was elected by a majority of five, his opponent being Mr. Nathaniel Ward. He was appointed assistant to Mr. James Luke, and for fifteen years he faithfully discharged his arduous duties. During this time he did much good work in general surgery, and established valuable methods of treatment especially in ulcers of the lower extremity. He was the first in this country to treat varicose ulcers by compression, and his methods are now generally adopted. He also showed considerable capacity and boldness as an operator, greatly excelling in operations for lithotomy and excision of joints. In 1861, he was promoted to the office of full surgeon. He had served long for that appointment, but he held it for rather less than two years. He was becoming so absorbed in his work at Moorfields, and in private practice that he felt he could not in fairness hold it any longer. It was at Moorfields he found work most congenial to his tastes, and it was there his ingenious and resourceful mind devised operations, which his neatness and delicacy of touch enabled him to perform with wonderful success. His career as an ophthalmic surgeon, moreover, was coincident with an extraordinary advance in that branch of medical science, and he

took a leading part in the advocacy and application of the improved methods of examination and treatment which were constantly being introduced. He saw the introduction of all the methods of research and treatment that we owe to Helmholtz, Donders, von Graefe, Bowman, Knapp and Liebreich.

It was about this time that Bowman, whose tastes and inclinations had always lain in the direction of general surgery, began to interest himself in diseases of the eye, and it was Critchett who advised him to devote himself to ophthalmology. In their early days Bowman was assistant surgeon at Moorfields under Critchett, but the latter with singular generosity begged the Committee to appoint his friend to the senior staff. He had the great satisfaction of having his request granted, and the two remained colleagues and close friends until the retirement of the one and the death of the other. They were a constant source of stimulus and encouragement to each other, and did more than any other two men of their time to raise the standard of British Ophthalmology, and to make Moorfields so widely known that it came to be regarded as an ophthalmic Mecca, to which came ophthalmologists from all parts of the world. Donders and von Graefe came to London in 1851, and that was the beginning of a remarkable friendship among those four men—a friendship broken in 1870 by the tragic death of von Graefe, the youngest of them all.

Critchett had special gifts as a teacher. His knowledge of literature and command of language enabled him to expound his subject in its most attractive form, and he would often impress an important point upon the memory of his students by the use of a happy illustration or by an appropriate reminiscence drawn from his own wide experience. His influence was also largely personal. He possessed a magnetism which never failed to attract younger men, who speedily became his devoted disciples. He did not write much, and his papers are scattered in medical journals, and in the Royal London Ophthalmic Hospital Reports, but everything he wrote bears the stamp of his own knowledge and individual experience. His clinical acumen was remarkable; he had a special gift for prognosis, and with wonderful prescience could predict the course a disease was likely to follow. He was always much interested in inflammation of the cornea, and Sir Anderson Critchett remembers that in one of the many professional conversations which they had together, his father said: "I nearly anticipated Hutchinson: for in a lecture which I gave on Strumous Ophthalmia, I said: the flattened nose and the strange marks about the mouth which are seen in many of those little sufferers almost make one imagine that they are the victims of hereditary syphilis." These words, the *ipsissima dicta* of his father, made a great impression on the son's mind and have continued to live in his memory.

In 1854, Critchett delivered a short course of lectures on Diseases of the Eye at the Medical School of the London Hospital. These lectures, written with great power and eloquence, were afterwards published in the *Lancet*, and attracted so much attention that the author was brought at once into prominent notice as an ophthalmic surgeon. They deal with the clinical aspects of ophthalmology, and are a masterly exposition of the knowledge of the time. They will well repay careful perusal, because they contain much valuable information about the treatment of ocular affections that is as helpful to-day as it was at the time the lectures were published. It is a great misfortune when knowledge of this kind is forgotten, and when the clinical experience gained by one generation is not made full use of by the next; but to the unspeakable loss of mankind, clinical experience too often dies with the clinician, and each generation of doctors is fated to make its own mistakes. In 1876, Critchett succeeded Mr. Hulke as ophthalmic surgeon and lecturer in ophthalmic surgery at the Middlesex Hospital, and a well-known surgeon of that hospital recently told the writer how profoundly he had been impressed by Critchett as a teacher, and how, as he watched him at work, he had been fired with the ambition to become an ophthalmic surgeon—an ambition which only stress of circumstances prevented him from fulfilling.

It was as an operator that Critchett was unsurpassed. As has already been said, his special manual dexterity had been noticed from the very outset of his career as a surgeon, and his peculiar skill became more and more conspicuous as his responsibilities increased. Courage and confidence were qualities which characterised all his operative procedures, but he was never rash, the interest of his patient being always uppermost in his mind. He also had the power to inspire confidence, a power begotten of a warm sympathy with suffering, to the relief of which all his energies were concentrated. His colleagues had great trust in his judgment, and constantly sought his advice. On these occasions a sure clinical instinct enabled him to know when to operate and when not to operate, and a ripe experience helped him successfully to devise operative procedures specially suited for the case under consideration.

He introduced into practice several methods of great value, and in many operations his peculiar skill wrought changes, which guided others to larger and more important modifications. Comparatively early in his career he published his method of subconjunctival tenotomy in operations for squint. This method of dividing the recti muscles by hook and scissors beneath the conjunctiva was peculiarly his own, and later on he developed it further in his operation for enucleation of the eyeball. Critchett first suggested and performed this operation on a patient

in Moorfields in 1851, and described it shortly afterwards in the *Lancet*. His idea was quite original, because he knew nothing of the work of Ferrall and others on the same lines. It soon became the recognised method of removing an eye, and no wonder when it is compared with the old operation, which was little short of barbarous. In the old method the globe was pulled forward by a thread which had been passed through it; the palpebral fissure was then freely divided to enlarge the opening; and a sharp double-edged pliable scalpel was plunged to the apex of the orbit, and swept round so as to divide all the structures that retain the eye. Critchett also devised the operation of iridodesis for making an artificial pupil, and abscission for staphyloma of the cornea. He also modified the von Graefe method of cataract extraction, and introduced a discussion on that subject before the Ophthalmological Congress at Heidelberg in 1864. It was after hearing Critchett's paper that von Graefe invented the narrow knife which bears his name. Linear extraction of cataract was at that time severely on its trial, and it is not too much to say that it was Critchett's advocacy at Heidelberg that saved it. He also, along with Bowman, did much to establish iridectomy in acute glaucoma when it was first introduced by von Graefe, in spite of the vigorous campaign of opposition against that operation at the time of its introduction.

Critchett always spoke with a persuasive charm, which was enhanced by a musical voice and a perfect delivery; and on occasion he could rise to a high pitch of eloquence. There are those living who can still remember the dramatic fire and force with which he defended successfully a former colleague at the London Hospital, whose professional position had been unjustly assailed. He was also an admirable French scholar, and could speak as fluently and eloquently in French as he could in his mother tongue. He greatly enjoyed attending meetings of ophthalmic surgeons on the Continent, and taking part in their discussions. In 1867, when he was just in his prime, the International Ophthalmological Congress, over which von Graefe presided, was held in Paris. de Wecker invited Critchett to operate on a German woman, blind from bilateral senile cataract. His son, at that time a medical student, had accompanied his father to the Congress and assisted at the operation, at the same time diverting the patient's attention by talking to her in her own language. Critchett operated on the right eye with his right hand, and on the left eye with his left. von Graefe was so overcome by the brilliant success of the operations that he publicly kissed the operator on both cheeks.

Critchett became a member of Council of the Royal College of Surgeons in 1870. He was President of the Hunterian Society

during two successive years, and Vice-President of the ophthalmological section of the International Medical Congress in London in 1881. He was also corresponding member of the Imperial Academy of Medicine of Rio de Janeiro, and an Honorary Member of the Academy of Medicine of Brussels. The Ophthalmological Society of the United Kingdom was formed in 1880, and Critchett was elected one of the Vice-Presidents. During the first session he contributed a paper on the value of peritomy in the treatment of chronic vascularization of the cornea, and in the second session he took a prominent part in the discussion on sclerotomy. At the Second Annual Meeting, in the absence of the president—Sir William Bowman—he delivered an address. At the time of this meeting his intimate friends knew that he was suffering from enlarged prostate, cystitis and granular kidney, but as he was not only attending to his practice with apparently unabated vigour, but also performing his numerous social engagements with all his accustomed hospitality and courtesy, it was hoped that his valuable life would be spared. It had been otherwise ordered, and he died somewhat suddenly on the morning of November 1, 1882, after having been laid aside only for a few weeks. Sir William Bowman made sympathetic reference to the loss of his "almost life-long friend" at the meeting of the Ophthalmological Society in the following December, and on the same evening the Council unanimously passed the following resolution: "That the Council of the Ophthalmological Society of the United Kingdom desire to record their sense of the great loss sustained by the Society, as well as by the profession at large, in the death of one of their Vice-Presidents, George Critchett, whose extended reputation at home and abroad, rested on the solid foundation of important services rendered to that department of the Medical Art to which he was chiefly devoted, and whose kindness of heart and excellent judgment were universally recognised and esteemed."

Thus passed a charming and impressive personality, and one of the most gracious of men. When Critchett died, rich and poor alike lost a friend. He was generous to a fault. His greatest pleasure was to dispense hospitality, and on the frequent occasions when friends gathered round his table his cultured versatile mind, his refined artistic tastes and his love for all athletic sports made him an ideal host. Those who knew George Critchett personally are now a small and rapidly diminishing band; but his name will be honoured by successive generations of ophthalmic surgeons not only for the valuable contributions which he has made to the science and practice of ophthalmology, but also for the example which he has left of a life of high endeavour crowned by successful achievement.

SOME SUGGESTIONS ON THE EMBRYOLOGY OF CONGENITAL CRESCENTS*

BY

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LONDON

IN dealing with the question of crescents seen ophthalmoscopically in relation with the optic disc it is justifiable to divide them at the outset into congenital and acquired types. We are not concerned here with the second group, which comprises those crescents (usually on the temporal side of the disc) which accompany myopia and which can often be seen to increase in size and alter in appearance during the period of observation. They are almost certainly due to a slow pathological process in the eye, even though their potentiality may in some cases possibly be present during intra-uterine life.

On the other hand those of the first group, the true congenital crescents, are present at birth and remain stationary throughout life. They are not accompanied by any signs of degenerative change in the eye and the refraction is often hypermetropic. These congenital crescents may occur in any situation around the disc, but Vossius. who examined 111 cases, gives the following figures :—

Below the disc	67	per cent.
Inwards	8.1	„
Down and in	7.3	„
Upwards	4.5	„
Up and out	7.2	„
Down and out	5.4	„

This shows that the inferior position is by far the commonest for a congenital crescent since it occurs in 67 per cent. of cases, whereas the percentage of crescents in all the other possible situations together is only 33 per cent.

These figures contrast strongly with Hertel's for acquired myopic crescents, which are as follows :—

Below	6	per cent.
Up	4	„
Out	79	„
Annular	11	„

Here the enormous preponderance of temporal crescents serves to distinguish this group from the congenital type and seems to point to a very definite connection between the myopic crescent and the posterior staphyloma, which is greater on the temporal side.

* Read before the Section of Ophthalmology of the Royal Society of Medicine, June 8, 1923.

We have then for consideration a group of cases of crescent characterized by the fact that they are congenital, stationary, not necessarily associated with any one error of refraction, and most frequently situated below the disc.

In this group there is apparently some factor which determines the greater proportion of inferior crescents and this factor must be looked for in the normal development of the disc, since an abnormality is more likely to be associated—either as arrest or perversion—with a normally existing embryonic structure than to arise *de novo* as a pure aberrance for which no normally occurring stage can be found to account. The embryonic structure in this case is the choroidal fissure. The presence of congenital crescents in other situations does not detract from the fact that the choroidal fissure is the determining factor in the inferior type. The presence

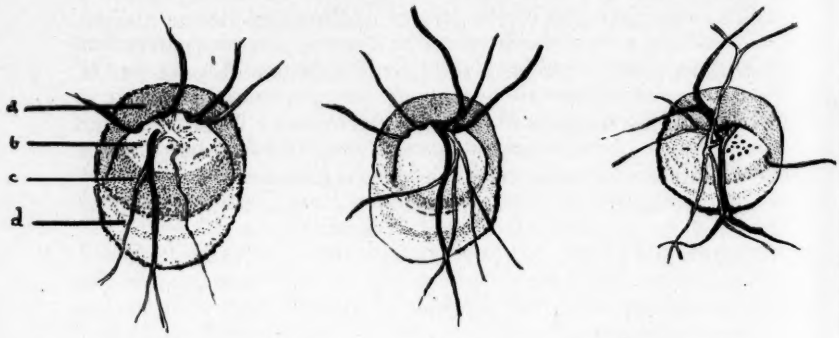

FIG. 1.

of the fissure will merely account for the preponderance of this type, since—as will be shown later—the essential condition for the formation of a crescent is that the pigmented outer layer of the optic cup should not reach quite up to the insertion of the optic stalk; the presence of the fissure merely allows of this occurring more easily below the disc than elsewhere and hence determines the predominance of the inferior type. A somewhat similar condition may, however, result in other situations, as will be explained below, but more rarely, since the chief predisposing factor (the fissure) is absent. Hence the low percentage of congenital crescents other than inferior crescents will be considered in the first place.

The first essential in understanding the formation of an inferior crescent is a detailed study of its ophthalmoscopic and microscopic appearances. The ophthalmoscopic picture is well known and curiously constant. Fig. 1 shows drawings of three typical cases.

A and B are from patients seen by the author; C is taken from Elschnig's paper on the subject and represents the disc during life of a case in which he was able to correlate the ophthalmoscopic and microscopic appearances. It will be seen that in all three the disc can be divided into four areas from above downwards, lettered in the diagram A as *a*, *b*, *c* and *d*.

First, there is a pinkish zone (*a*), resembling the upper part of the normal disc. This appears slightly raised, and the upper branches of the vessels curl over it. It has a sharp crescentic edge

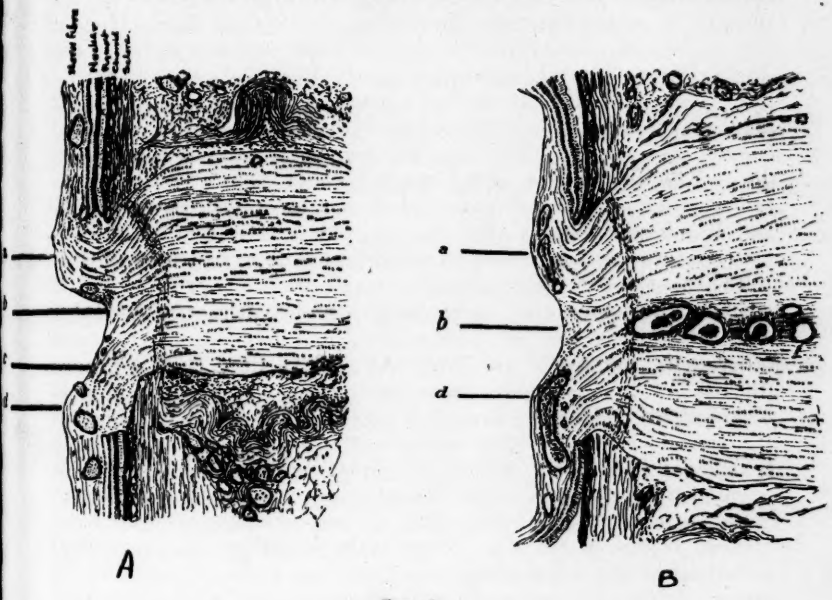

FIG. 2.

below, which separates it from *b*, the pale central zone, which represents the bottom of the physiological cup. This is slightly depressed and the vessels appear from its centre, where the *lamina cribrosa* can sometimes be seen. This zone gradually slopes forwards and passes into the third zone (*c*), which is smooth and pink or greyish like the upper part of the disc and separated by a more or less well-defined edge from *d*, the fourth zone or crescent, which is white or yellow and is often slightly raised. This crescent is frequently divided horizontally by a band of shadow which appears to be due to a small ridge.

Fig. 2A represents a vertical section through an optic disc with an inferior crescent. It is drawn from a slide very kindly

lent me by Mr. Affleck Greeves. It will be seen that the four areas seen ophthalmoscopically can be recognized here. The uppermost pink area is seen at (*a*) as a ridge of nerve fibres. It passes more or less abruptly into the physiological pit, from which the vessels emerge in the area (*b*). This surface slopes forward and so forms the pink zone (*c*) in which are seen some small vessels. The lowest region is again raised almost to the level of (*a*), and shows a definite ridge (*d*) which represents the shadow seen on this lower area ophthalmoscopically. The surface of the disc should be compared with that in Fig. 2B showing a section through the centre of a normal disc. Here it will be seen that there are only three areas (labelled *a*, *b*, and *d*). The upper (*a*) corresponds with (*a*) in Fig. 2A, while (*b*) is the physiological pit (also seen at (*b*) in Fig. 2A). The lower area (*d*) corresponds with (*d*) in 2A, while the smooth slightly forward sloping area seen at (*c*) in Fig. 2A is not represented on the normal disc. The appearance of the discs then in Fig. 1 is due to the interpolation of a smooth area (*c*) between the physiological pit (*b*) and the lower edge of the disc (*d*). It is with the origin and nature of this area (*c*) that we are concerned.

The next point of note in Fig. 2A is the arrangement of the retina at the upper and lower margins of the disc. At the ***upper edge*** the nuclear and pigment layers end by blending with each other at the margin of the disc. The nerve fibre layer becomes thicker and the nerve fibres curve backwards round the edge formed by the sharp ending of the nuclear layers. The pigment layer and the choroid extend farthest towards the nerve and form a sharp spur which indents the nerve. A similar condition is seen at both edges of the normal disc (Fig. 2B) and the constriction thus formed is the narrowest part of the nerve. (The exact arrangement of the nuclear layers where the retina ends is subject to individual variations in normal discs.) The sclera does not extend quite so far as the pigment layer and the ***lamina cribrosa*** is seen continuous with the sclera a short distance behind the point of maximum constriction of the nerve, and stretches across the nerve just where it begins to widen out again.

At the ***lower edge*** of the disc in Fig. 2A the nuclear layers of the retina do not extend so far as at the upper edge. They end by blending with each other, but the pigment layer ends on a level with the other layers and does not extend as a spur. The sclerotic is continued beyond the pigment layer and so comes to lie immediately deep to the nerve fibre layer, separated from it by a rapidly thinning continuation of the choroid. The sclera runs up to the edge of the nerve and its fibres are continuous with those of the ***lamina cribrosa*** here as they are above. The appearance of indentation or constriction of the nerve at its exit from the eye thus

is absent below, since this indentation is normally caused by the pigment epithelium which here has fallen short of the edge of the nerve. Hence the essential difference between the upper and lower margins of the disc (normal and abnormal parts) is that, while at the upper edge the pigment layer indents the nerve, at the lower margin it fails to reach the nerve altogether and so there is an area just below the disc (turned towards the vitreous) in which the nerve fibre layer is alone present. It is to be noted that in Fig. 2A, there is no sign of atrophy of this nerve fibre layer in the crescent, the ridge (*d*) being practically the same height as the ridge (*a*) at the upper margin of the disc, so that there is nothing to suggest that the condition is due to stretching, as has sometimes been suggested.

These facts can also be expressed in another way, thus: if a series of sections approximately through the centre of normal discs be examined it will be found that the distance between the upper and lower endings of the pigment layer is always the narrowest part of the nerve, and that this distance is always less than the diameter of the nerve at the centre of the *lamina cribrosa*. In eyes presenting inferior crescents, however, the distance between the upper and lower ending of the pigment layer is always equal to or more than the diameter of the nerve at the *lamina cribrosa*. This shows that there is an actual anomaly of development of the edge of the disc and not merely an oblique insertion of the nerve. That this anomaly involves the lower portion of the disc and adjacent retina only is indicated by the fact that the *lamina cribrosa* is normal in structure and position and that the nerve behind it is normal.

Figs. 3 and 4 are taken from Elschnig's paper on "Conus nach unten", and show a similar condition. Fig. 4 is not a typical case since there is atrophy of the nerve fibres in the crescent, which is not seen in Figs. 2A and 3. Fig. 3 represents the microscopic appearance of the case seen in Fig. 1C.

We have then to account for a condition in which the retinal pigment epithelium and also the nuclear layers have failed to reach the lower edge of the nerve, so that a small area devoid of every layer except nerve fibres is interpolated between the lower edge of the disc and the true lower edge of the nerve.

A study of the normal development of the upper end of the choroidal fissure shows us, as I pointed out in a communication to the Anatomical Society in 1920, that normally there is an eversion of the unpigmented inner layer of the optic cup along the edges of the cleft in its upper part. This eversion is not so well marked in the human eye as in other forms, but that it does occur is shown by Fig. 5A. This is a drawing of a section through the eye of a 15mm. human embryo just below the insertion of the optic stalk. It shows the choroidal fissure open, with the as yet undifferentiated inner layer everted in the fissure. Fig. 5B is a section through the same

eye a little lower down, shewing that fusion has occured between the lips of the fissure, and a little mass of unpigmented inner layer cells has been left in continuity with the pigment layer, though they have here lost their original connection with the inner layer.

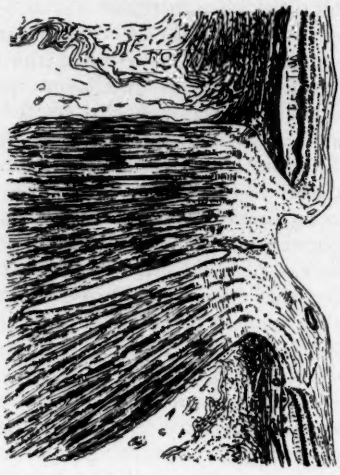

FIG. 3.

FIG. 4.

This eversion of the inner layer occurs in a large number of vertebrate eyes (*e.g.*, mouse, pig, chick, terrapin, dogfish), and in some the connection of the everted portion with the inner layer is lost after fusion of the edges of the fissure, while in others it persists. If it persists, nerve fibres are able to grow into the everted portion, since it is structurally continuous with the inner, fibre-bearing

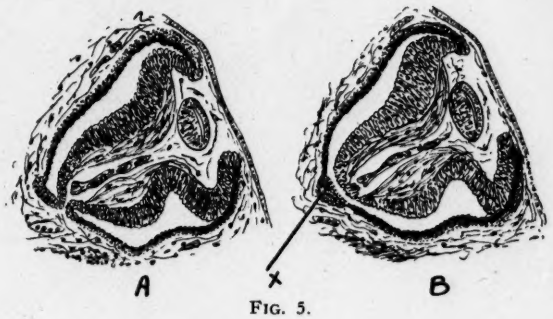

FIG. 5.

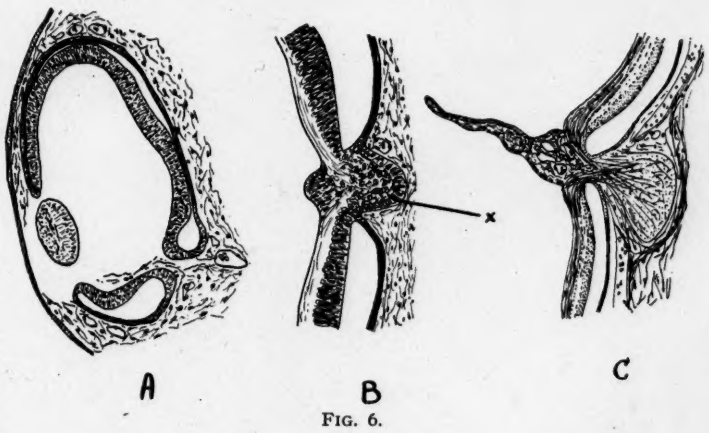

FIG. 6.

layer of the optic cup. Thus nerve fibres may leave the eye not only at the extreme upper end of the cleft where the inner layer of the cup is continuous with the ventral layer of the optic stalk, but also along a varying portion of the cleft below this. This condition of things is seen in its most highly elaborated form in the chick, in which the everted lips of the fissure with nerve fibres growing into them show as a pigment-free ridge on the back of the embryonic eye below the nerve, and later, in the adult, these nerve fibres form

the *cauda* of the nerve. Fig 6 shews three stages in the development of the *cauda* of the hen. A shows the whole eye of a three days' chick with the fissure still open and the edges everted. B shows the region of the fissure after closure, the unpigmented mass of cells (x) being comparable to the mass (x) in Fig. 5B, with the difference that in the chick it has retained its connection with the inner layer. C shows the developing *cauda* in an older chick where the cells of the projection have been obliterated by the nerve fibres.

Fig 7 shows the back view of a reconstructed model of a chick's eye (A) and a human (B) (13 mm.), showing the non-pigmented area below the disc. In the human embryo this unpigmented area has quite disappeared in the 18 mm. stage, while in the chick it persists.

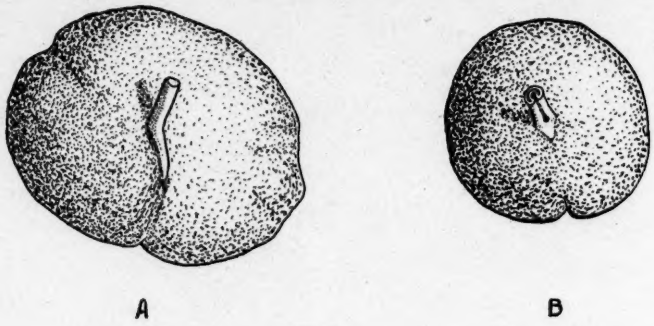

FIG. 7.

The condition in the adult fowl is worth studying. Fig. 8 shows a longitudinal section through the optic disc of a hen. Apart from the presence of a pecten, which we are not concerned with here, the following points are of note. It will be seen at once that the nerve is as it were drawn down as it enters the eye and so forms a long tail-like prolongation below, inside the sclerotic, known as the *cauda* of the nerve. From this it is obvious that the optic disc seen ophthalmoscopically is a long vertical oval and not a circle. The appearances seen in Fig. 8 bear comparison with those of the inferior crescent seen in Fig. 2A. In the first place the upper margin of the hen's disc shows the sclera (which in birds is cartilaginous) ending at the nerve, which is here slightly indented by the pigment layer. The constriction of the nerve, is not so marked as in the human eye in Fig. 2A.

Below, the cartilaginous sclerotic comes up to the lower edge of the nerve and the nerve fibres here turn round with a much gentler curve than they show at the upper margin. The pigment layer and choroid indent the nerve above, but below they fall a long way short

of the lower border of the nerve, so that over a certain area (*c*) all the layers of the retina are absent except the nerve fibre layer, which is in contact with the sclera, only separated from it in part by a large vein. This area therefore resembles the area (*c*) in Fig. 2A in that it represents an area below the nerve on the vitreous surface of the eye over which only nerve fibres are present. It

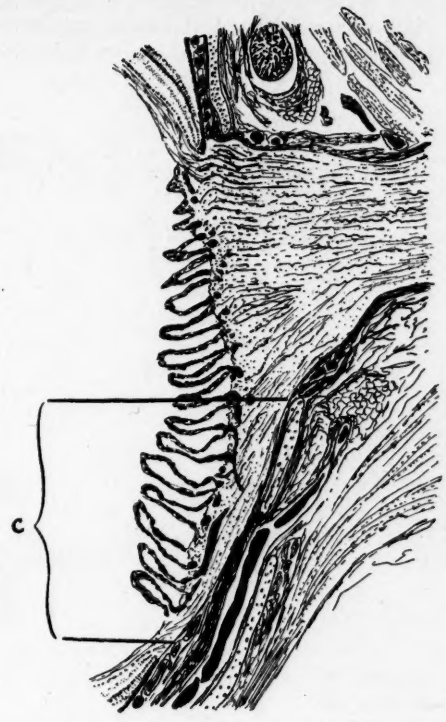

FIG. 8.

lies wholly within the sclerotic in both cases and does not affect the nerve except as regards the curve made by the lower bundle of nerve fibres as they enter the nerve. In Fig. 8 this area appears in a more exaggerated form than in Fig. 2A. Fig. 9 is a scheme showing the essential similarity of the condition in the hen and the human inferior crescent, together with a normal human disc shown in the same way. In birds the *lamina cribrosa* is not marked though there is a certain amount of thickening of the connective tissue

between the bundles of nerve fibres in the upper part of the nerve which probably represents it.

Thus we see that the persistence of the unpigmented everted projection seen below the nerve in many vertebrate embryos, including man. may give rise by its normal persistence (in the bird) to a condition resembling anatomically an exaggerated inferior crescent. Is it not likely, therefore, that the occasional inferior crescent in man is formed in the same way by the persistence of the continuity of the inner layer of the optic cup with the everted portion and the subsequent growth of nerve fibres into it? The

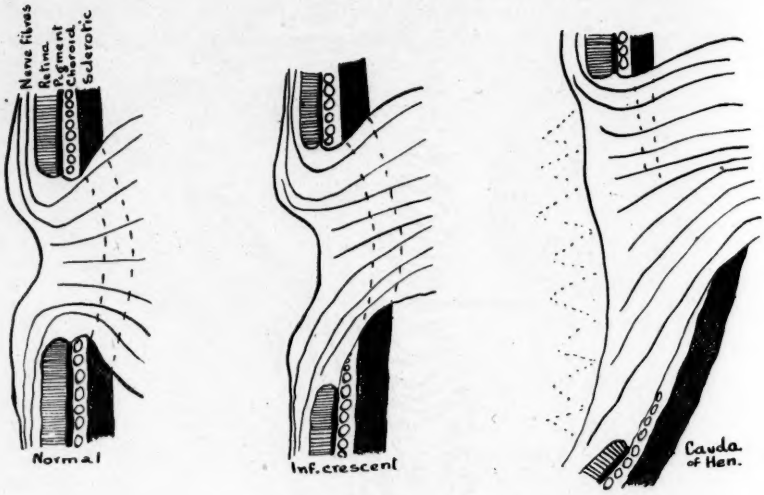

FIG. 9.

inferior crescent, then, can be looked on as an attempt at the formation of a *cauda* to the optic nerve similar to but much less than that normal in birds.

To argue from the normal hen to the abnormal man may seem to err in the direction of speculation, even though a definite point of similarity can be found embryonically. It is, therefore, advisable to examine other forms with a view to seeing if any connecting link can be obtained. It is among the Reptilia, in the rôle of common ancestors, that it will be as well to look. The embryo lizard is suggestive. Compare Fig. 10, which is a transverse section through the lower part of the optic disc of a Calotes embryo, with Fig. 6C, and the similarity is striking. The apparent *cauda* in the lizard is not very long, however, and at this stage a vertical section through the disc much resembles an inferior crescent. Fig 11 shows three

reconstructions of vertical sections through the optic discs of lizard embryos. A and B are from Calotes embryos, and C from a West African lizard. The line a b shows the plane of the section seen in Fig. 10. It will be seen in all of them that the nerve enters obliquely and is slightly drawn down, so that, whereas at the upper margin of the disc the pigment epithelium forms a fairly sharp edge round which the nerve fibres turn with an acute bend, at the lower margin the curve of the nerve fibres is much gentler. Also, as was pointed out for inferior crescents in man, the distance

FIG. 10.

FIG. 11.

between the upper and lower limits of the pigment epithelium is greater than the diameter of the narrowest part of the nerve. The embryo lizard thus shows a condition extremely resembling an inferior crescent, which has been elaborated by birds into the well-marked *cauda*.

Fig. 12 shows as a point of interest the possibility that the process in man may go even farther. Fig. 12A is a transverse section through the *cauda* of a hen and Fig. 12B is taken from Elschnig's paper and shows a curious case in which the nerve appeared to run obliquely at the back of the eye. The similarity

in all essential points between the two figures is striking; unfortunately Elschnig does not give full enough details of his case to enable us to stress the analogy further.

The question of the occurrence of congenital crescents in man in situations where they could not have been associated with the choroidal fissure is of more difficulty. There are, however, a few suggestive facts to be considered.

Few congenital crescents occurring in anomalous situations have been investigated microscopically and I have not been able to

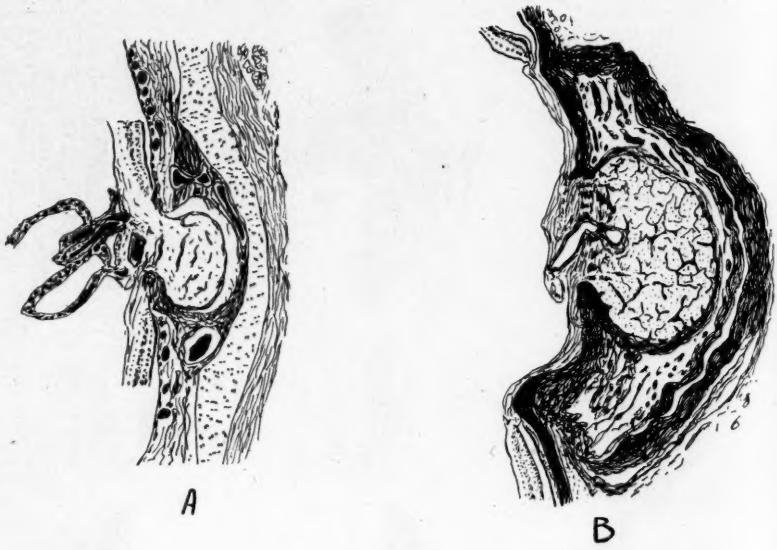

FIG. 12.

obtain a specimen. It appears, however, from the work of Elschnig and others that the condition presents a resemblance to an inferior crescent, the same main feature, namely, a failure of the pigment epithelium and choroid to reach the edge of the nerve, being present. In some cases, of crescents inferior and otherwise, stress is laid on the atrophic condition of the sclera in the crescent area, though this does not appear to be uniformly present. A point of great constancy, however, is the failure of the choroid in the crescent. In most cases the choroid proper is only continued a very short distance beyond the edge of the pigment epithelium, though it can often be traced as a very atrophic membrane as far as the edge of the optic nerve proper. All congenital crescents have, then, in common the failure of the pigment epithelium to

reach the edge of the nerve and the failure of the choroid just beyond the edge of the pigment.

How can one explain the falling short of the pigment epithelium in regions remote from the fissure? Normally in man neither the dorsal nor the invaginated ventral wall of the optic stalk shows any signs of pigmentation during development, the pigment always stopping short exactly where the stalk joins the globe of the eye. This is not necessarily true in other animals and may vary in abnormal cases in man. Pigmentation of the optic stalk occurs normally in bat embryos.

It seems likely from the work of Coats, Monthus and Opin, and others that a certain class of congenital anomalies of the eye may be due to the aberrant differentiation of one part of the optic cup into tissue resembling that normally derived from another part. For example the ventral layer of the optic stalk may give rise to a patch of rudimentary retina in the nerve. In the same way the usual sharp differentiation between pigmented epithelium and unpigmented optic stalk at their junction might fail in one direction or another; either the pigment might extend on to the stalk or the unpigmented stalk might appear to encroach on the globe. This failure of pigmentation in the outer layer of the optic cup might conceivably occur in regions far away from the insertion of the nerve and indeed has been shown to do so. It is still more likely to occur in situations where pigmented normally joins unpigmented epithelium, namely round the disc.

This aberrant differentiation was well shown in a case of Mr. Frank Juler's, which I had the opportunity of examining and which has since been published. Here the pigment epithelium was continued directly along the optic nerve for some distance. The same case also showed the converse condition, namely a failure of pigmentation in the outer layer of the cup. There were, above the disc but not in connection with it, some small oval areas of cells exactly resembling cells of the pigment epithelium and continuous with them, but containing, some no trace of pigment and others a few brown granules only.

This serves to show that a localised failure of the pigment epithelium may occur. It is conceivable that such an area arising in association with the insertion of the optic stalk might give rise to one type of congenital crescent.

With regard to the failure of the choroid in the region of the crescent the following facts are of importance. The development of the choroid appears to occur *pari passu* with that of the pigment epithelium, and they seem to exercise some reciprocal action. Mesoderm which is in contact with the pigment epithelium develops into choroid, but mesoderm in contact with the inner layer of the optic cup does not. This applies both to the mesoderm which

passes into the eye through the fissure and to the mesoderm in contact with the normally everted fold of inner layer along the fissure or with abnormally everted inner layer in an inferior crescent or a coloboma. The interdependence of the pigment and the choroid is also shown by Juler's case mentioned above. Here the pigment epithelium was abnormally continued along the nerve and was accompanied by choroid which thus extended beyond its normal limits to follow the pigment epithelium. The failure of choroid to develop except where mesoderm is in contact with pigment epithelium can be seen in the chick, in which the choroid stops short at

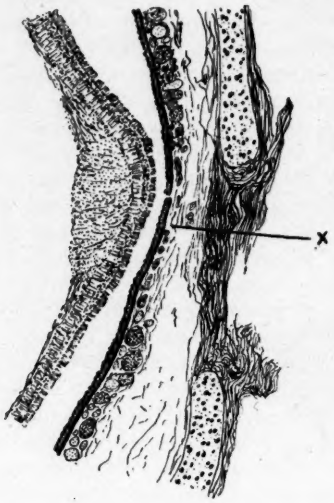

FIG. 13.

the edges of the developing *cauda*, and in the mouse, in which for a little time there is a lagging behind of the choroid just below the nerve where the eversion occurred during closure of the fissure.

In some animals the result of the inhibiting action of the fissure on the development of the choroid remains more or less permanent, so that even after the fissure has become completely obliterated and the pigment epithelium has coalesced across it an area of relative atrophy of the choroid remains to mark the site. This is the case in the alligator, as is seen in Fig. 13 at (*x*). The same absence of choroid where mesoderm comes in contact with inner layer has been shown experimentally by Koyanagi. He examined the eyes of embryo rabbits bred from a buck with congenital coloboma, and showed that in the developing coloboma there was often excessive

eversion of the inner layer and absence of the choroid, so that the floor of the coloboma was formed by the duplicated retina in contact with the sclerotic. It therefore seems probable that the absence of pigmented epithelium in a congenital crescent is enough to account for the failure of the choroid also.

With regard to the occasional atrophy of the sclerotic seen in the crescents it is to be mentioned that, to a certain extent, the appearance of the sclerotic condensation in the embryo chick is related to the presence of the choroid. This is shown by the fact that the sclerotic condensation first appears round the equator of the eye and spreads towards the posterior pole, showing at one time a very definite thin area behind the *cauda*. The condensation of mesoderm is succeeded by a cartilaginous change and this is also distinctly delayed along the *cauda*, the sclera remaining fibrous here for some time but finally becoming cartilaginous like the rest. In the alligator, however, the cartilaginous change never occurs in the region of the choroidal thinning described below the nerve, and in Fig. 13 it can be easily seen that there is a gap filled by fibrous tissue in this situation. Sometimes then the sclera is permanently inhibited and sometimes only retarded. This is comparable to the varying condition of the sclera found in the floor of congenital crescents.

To sum up therefore, we may say in the first place, that congenital crescents in any situation are due to the failure of the pigment epithelium to reach the site of implantation of the optic stalk.

This failure may occur anywhere, since aberrant differentiation of any of the various parts of the secondary optic vesicle is known to occur. It is, however, much more likely to occur below the disc than elsewhere, since it is normal here at one stage of development in man. Hence the greater frequence of inferior crescents, which can be looked on as developmentally homologous with the *cauda* of birds: the architectural basis of the *cauda* being present though small in the normal human embryo.

This failure of the choroid is directly correlated with the absence of pigmented epithelium and the occasional failure of the sclera has its parallel in the retardation of condensation along the fissure during development.

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PROPHYLAXIS AGAINST BLENNORRHOEA NEONATORUM IN DENMARK*

BY

GORDON NORRIE

COPENHAGEN

CREDÉ'S method was adopted in the Royal Lying-in Hospital of Copenhagen in the year 1882, and on the basis of the results obtained two different papers were read at the International Medical Congress held at Copenhagen in 1884. In 1886, I began a series of papers, chiefly in the medical press, with the object of having the method made compulsory for midwives. In this I was successful in 1900, and since that date it has been compulsory for every midwife to instil a solution of silver nitrate (1 : 150) into the eyes of the child. Before doing so the eyes must not be washed but are to be wiped with dry cotton or gauze.

I may remark (1) that midwives assist at almost every delivery in Denmark and that it is very seldom that only a doctor is present; (2) that since 1714 the midwifery system is legally regulated; (3) that a very severe training school for midwives has been in existence since 1787; and (4) that the time of training for midwives is one year.

Before 1857 the education of blind children was in private hands, but in that year the state erected the Royal Blind Institute (Det Kongelige Blindeinstitut) in Copenhagen. Although it is not compulsory for blind children to go into the Institute, there is scarcely any blind child educated outside it, *i.e.* practically all blind children are to be found in it. The age of admission into the Institute was originally from ten to eleven, but as the Institute had not sufficient room to receive all the blind children, a preparatory school (Den Kongelige Blindeforskole) lying near the sea and about 60 miles from Copenhagen was established. In this school the children are accepted from their sixth to seventh year. Some two years ago at the same place and under the same director an asylum for small blind children was also established. The youngest patient at present under treatment there was born in 1920 and is blind as a result of ophthalmia neonatorum. I hold the posts of doctor for the Copenhagen Institute and oculist for the preparatory school.

In the following table I give the numbers of children blind as a result of ophthalmia neonatorum in both Danish Institutes arranged according to the year of their birth in order to show the results of prophylaxis. Of course it is not to be expected that any great improvement would follow immediately on the introduction of prophylactic methods as time had to be allowed for the midwives to

* We are indebted to the Ministry of Health for this valuable communication.

learn the necessary procedure. The table shows that there is no change for the first five years, but that after 1905 the result is very evident.

Of children born	1875-1879	12	were	blind	from oph. neonat.
„ „	1880-1884	7	„	„	„
„ „	1885-1889	11	„	„	„
„ „	1890-1894	15	„	„	„
„ „	1895-1899	10	„	„	„
„ „	1900-1904	16	„	„	„
„ „	1905-1909	3	„	„	„
„ „	1910-1914	3	„	„	„
„ „	1915-1919	1	was „	„	„
„ „	1920	1	was „	„	„

Practically all blind children born before 1916 are in the Institutes; some children, however, born since that year may still remain in their homes, and some of these may owe their blindness to ophthalmia neonatorum.

Thanks to the excellence of our midwives our results seem to show that we may only expect one case every second year. We may possibly even improve on this, but it must be remembered that prophylactic measures cannot prevent a later infection after birth.

I may add that the population of Denmark is 3,250,000.

ANNOTATIONS

Standards for Out-Patient Service in Ophthalmology

An interesting report on this subject is issued in the April number of the *American Journal of Ophthalmology* by the Ophthalmological section of the Associated Out-Patient Clinics of New York City. The report is divided into two sections: (1) a summary of conditions found by survey of representative eye clinics in New York; (2) an outline for an ideal out-patient service in Ophthalmology. The first part deals with the subject under the following headings: consultation facilities; medical organization; space, arrangement, equipment and facilities; admission and distribution of patients; fees; routine history and examination; refraction and provision of glasses; follow up; records and filing; research and teaching; efficiency tests and statistics. Probably the most interesting portion of this section is that dealing with refraction, in that the reporters advise that refraction work be paid for. No ophthalmic surgeon will question the advisability of this step; it is ideal, but not always possible to obtain, at any rate in this country at the present time; nor will any deny the supreme

importance of having the ophthalmic service linked up with other departments such as the laboratory, radiological and other departments of a general hospital. The second section of the report sets forth the principles of organization and procedure which are believed to be essential for a satisfactory out-patient service in our speciality. Consultation facilities have already been mentioned; with regard to organization and personnel, ward service and out-patient service go hand in hand; unified service is to be aimed at; every member of the staff should have some duties and privileges in the out-patient department, and, after a proper period of probation, some ward and operating duties and privileges; the chief of clinic should be the senior assistant surgeon in the operating room, he should be in direct charge of the clinic work under the direction of the surgeon. Each new patient should be seen by the surgeon or by the chief of the clinic before a diagnosis is made or treatment instituted; the entire staff should be assigned definite hours for attendance in the out-patient department, the chief of the clinic to be present during the whole clinic session of the day on which he is on duty; clinic conferences should be held every week, and junior men should be encouraged to shew cases and make reports; lastly, the ophthalmologist should be relieved, as far as possible, of all duties not connected with the professional care of the patients. Under space, arrangement, equipment and facilities, a very complete armamentarium is devised; in regard to procedure, it is strongly laid down that the number of patients admitted on any day should be no more than can be adequately dealt with by the staff. Much of this report is ideal; but in this country the question of the expense is prohibitive. Most hospitals are so badly off that the governing bodies would refuse to sanction the appointment of paid refraction assistants; while, without rebuilding the whole out-patient department, it would be sometimes impossible to provide room for an adequate service such as is outlined. English ophthalmologists must, we fear, continue to carry on as best they can with the facilities provided, such as they are; it is extremely difficult to organize proper teaching when the surgeon is single-handed and has to treat the patients without assistance, or with only inadequate assistance. Yet we feel that this report is one that should be read and studied by all connected with the management or care of an out-patient department.

Mackenzie's Diseases of the Eye; Author's Copy with holograph notes

Peculiar interest is attached to copies of any works which have been the author's own personal property, and particularly is such the case when the book in question is a famous one. No one could doubt the value of such a book as Harvey's great work on the

circulation; if the first edition with the author's marginal notes were to appear on the market, it would be priceless. We think that ophthalmologists throughout the world will agree with us in the supposition that, in our own speciality, the famous book by William Mackenzie, of Glasgow, on diseases of the eye, is of such a character. As Dr. Freeland Fergus has pointed out in his article on the author in the *British Journal of Ophthalmology*, Vol. 1, p. 145, Mackenzie's was one of the last of the great text-books in our subject that appeared before the dawn of modern scientific ophthalmology, and with that by Sir William Lawrence, by far the most complete. The date of its publication was within the antiphlogistic age, a time when inflammation was combated by most drastic methods; how our forefathers found room for the enormous numbers of leeches that were applied round an inflamed eye has always been a mystery; calomel and antimony were in the ascendant, and it can have been no light ordeal for anyone to go through the orthodox mode of treatment for such a condition as iritis in those good old days; such a patient could compare himself with perfect truth to those of whom it is said that they had passed through great tribulation. Through the generosity of Dr. A. Maitland Ramsay, the Bowman Library has recently been enriched by the gift of the first edition of Mackenzie's book in two volumes, interleaved, and dated 1830. What makes this gift so extraordinarily interesting is the fact that on almost every page the author has written notes referring to cases similar to the ones under discussion, which have occurred in his practice and in current literature; even the covers have been utilized in this way, while in some places extra slips of paper have been carefully pasted in. The book is practically as it left the great author's consulting-room table, and after a lapse of more than 90 years pieces of contemporary blotting paper can be found between its leaves. References to cases abound on nearly every page; in places, tags of Latin and of Greek are inserted: the most interesting of these occurs in reference to the case of the facial wound sustained by the Duke of Guise at the siege of Calais, reported by Ambroise Paré; this wound was caused by a fragment of an English lance, which Paré was able to remove with a pair of farrier's pincers, and the scar resulting therefrom gave the nickname of "le balafré" to the Duke, which persisted throughout his life. Mackenzie notes as follows: "This description will naturally recall to the classical reader, the fatal wound of Pandarus in the Iliad," and then follow the four lines of the Greek, with liber 5,290 at the foot.

The author seems to have utilized any and every piece of paper which came in his way, for on the back of one slip occurs the following fragment of a letter: "Sir, I request your company

on Wednesday the 30th current at 2 p.m. to attend the funeral of ——— *my brother, yours faithfully.*"

Space does not allow us to give any lengthy extracts from the notes which are written in the rather crabbed, though perfectly legible handwriting of the author; suffice it to say, that those who are interested can easily find the volumes in question by consulting the library card index. Let us hope that those who take the trouble to examine these unique historical treasures will echo the words of the writer of Ecclesiasticus: "Let us now praise famous men and the fathers that begat us," and be grateful to the President of the Ophthalmological Society of the United Kingdom for his most interesting and valuable gift.

INTERNATIONAL CONGRESS OF OPHTHALMOLOGY

(1925)—Notice of Postponement

The Committee of British Ophthalmologists appointed to organize an International Congress in 1925 finds, with regret, that it is unable to do so in accordance with the conditions under which the British invitation was accepted by the Washington Ophthalmological Congress in 1922. It will be remembered that at Washington it was decided that the next Congress should be strictly International and that German should be one of the official languages. The Committee has since been informed that the Société Française d'Ophtalmologie, the Société d'Ophtalmologie de Paris and the Société Belge d'Ophtalmologie have passed resolutions to the effect that they feel themselves unable to participate in a Congress if Germans are invited. The Committee is of opinion that to proceed with the Congress in these circumstances would tend to perpetuate a schism in the ranks of Ophthalmology and militate permanently against the progress of the science which all desire to promote. The Committee has, therefore, reluctantly decided to postpone the Congress.

OXFORD OPHTHALMOLOGICAL CONGRESS, 1923

THE fourteenth annual meeting of the Oxford Ophthalmological Congress was held at Oxford on July 4, 5, 6, and 7. Members met at dinner on the evening of Wednesday, July 4, in the Hall of Keble College. The proceedings took place in the Department of Human Anatomy of the University Museum, which had been once more placed at the disposal of the Congress by

Professor Arthur Thomson, the University professor of human anatomy. The majority of the members attending the Congress were again housed in Keble College, by the courtesy of its authorities—an advantage which is deeply appreciated and adds not a little to the success of the meeting each year. The attendance, especially from the Continent and from British Possessions, was greater than that of last year or any previous year, making the Congress of an even more international character than usual and a record in numbers.

At 10 o'clock on the morning of July 5 a short opening address was given by the Master, Mr. Sydney Stephenson, who received a hearty welcome.

A discussion on the Relationship of Dental Sepsis to Diseases of the Eye was opened by Mr. W. R. Ackland, of Bristol, from the dental point of view, and by Mr. W. Lang, from the ophthalmic aspect; it was well sustained by Dr. T. Harrison Butler (Leamington), Professor J. van der Hoeve (Leyden), Dr. S. Lewis Ziegler (Philadelphia), Mr. P. H. Adams (Oxford), Dr. Sanford Gifford (Omaha), Mr. N. C. Ridley (Leicester), Miss M. Gilchrist (Glasgow), Mr. A. W. Ormond (London), and Dr. Richard Kerry (Montreal).

At the close of the discussion the annual meeting was held, when the Secretary reported that twenty-two members had been elected, making a total membership of 350, and further that the report of the Honorary Treasurer, Sir Anderson Critchett, K.C.V.O., showed that the financial position was sufficiently good to enable the Congress to make a second donation of ten guineas to the illustration fund of the Ophthalmological Society of the United Kingdom.

In the afternoon papers were read by Lieut-Colonel H. Herbert (Hove), Dr. C. F. Bentzen (Copenhagen), and Dr. H. Gjessing (Drammen), bearing upon the subject of glaucoma. Afterwards Mr. N. C. Ridley (Leicester) read a report of a case of orbital neoplasm. Colonel Herbert's paper was discussed by Professor Arthur Thomson.

On the morning of July 6 the chief contribution was the Doyne Memorial Lecture, delivered by Dr. H. Moss Traquair (Edinburgh), who chose as his subject the differential character of scotomata and their interpretation. The lecturer's work on the subject has achieved world-wide repute, and his admirably delivered address was warmly received. At the conclusion Dr. Traquair was presented with the Doyne Memorial Medal for 1923.

Two papers were taken before the lecture—the first by Dr. Sanford Gifford, of Omaha, U.S.A., on "Intra-cisternal Injections in the Treatment of Luetic Optic Atrophy," and the second by Dr. Lundsgaard (Copenhagen) on the "Finsen Treatment of

Conjunctival Diseases." The latter was of especial interest in that the author, working in the birthplace of the Finsen light treatment, is an authority on the subject. After the lecture Professor van der Hoeve (Leyden) read a paper on the rare condition known as tuberose sclerosis and its relationship to Recklinghausen's disease. A rather long morning session was concluded with a paper by Mr. T. Harrison Butler on the organization of ophthalmic clinics and hospitals.

In the afternoon Mr. Rayner Batten showed some beautiful drawings of conditions of the macula, pointed out the value of drawings of the fundus in clinical ophthalmology, and made some remarks upon the training of those who desire to undertake such work. Mr. John Batten followed, and as an artist gave an extremely interesting contribution on memory drawing by his own method of training. Professor van der Hoeve (Leyden) described some original work on accommodation, and a report by Dr. T. Harrison Butler of his experience of muscle recession and muscle tucking concluded a strenuous day's work.

On Saturday, July 7, the morning was devoted almost wholly to a discussion, introduced by Mr. R. J. Coulter, of Newport, Mon., on the diagnosis of coal-miners' nystagmus and its relationship to the Workmen's Compensation Act. An excellent exchange of views took place to which the following contributed :— Dr. J. S. Haldane, F.R.S., Mr. G. H. Pooley (Sheffield), Dr. T. Lister Llewellyn—(members of the Miners' Nystagmus Committee of the Medical Research Council), Dr. Elworthy (Ebbw Vale) Mr. T. Harrison Butler (Leamington Spa), Professor van der Hoeve (Leyden), Mr. Percival Hay (Sheffield), Mr. R. H. Dickson (Newcastle, Staffs.), Mr. Cridland (Wolverhampton), Dr. Stewart Barrie (Glasgow), Mr. A. T. Paterson (Durham), Mr. J. Jameson Evans (Birmingham), and Mr. Herbert Caiger (Sheffield). A paper by Dr. T. Stewart Barrie on colour vision in amblyopic eyes associated with strabismus convergens followed, and was discussed by Mr. T. Harrison Butler. This concluded the proceedings of the Congress.

Members from abroad included Professor van der Hoeve (Leyden), Dr. K. K. K. Lundsgaard, Dr. Henning Rönne, Dr. Bentzen and Dr. Saunte (Copenhagen), Dr. Gjessing (Drammen), Dr. Kugelberg (Upsala), Dr. Lewis Ziegler, Professor Friedenwald, Dr. J. S. Friedenwald, Dr. Sanford Gifford, and Dr. W. Linton Phillips (U.S.A.), Dr. Richard Kerry (Montreal), Lt.-Col. P. Bell (Winnipeg), Lt.-Col. R. E. Wright, I.M.S. (Madras), and Dr. John Stevenson (Christchurch, N.Z.).

The official dinner was held in the Hall of Keble College on Thursday night, and among those present as guests were Sir Archibald Garrod, K.C.M.G., Mr. W. R. Ackland, and Professor

Arthur Thomson. On Thursday afternoon a garden party was given at St. John's College, Lieut.-Colonel C. G. Douglas, C.M.G., Fellow of the College, acting as host. On Friday afternoon, after tea in Keble Gardens, a visit was made to the Pitt Rivers Museum, when the curator, Mr. Henry Balfour, kindly pointed out and described many of the objects of interest. The Congress may well be said to have again this year realized the aim of its founder, the late Robert W. Doyne, by combining good work with the opportunity of members becoming more closely acquainted with one another.

The contributions made at the Congress will be published as usual in the transactions of the Ophthalmological Society of the United Kingdom.

ABSTRACTS

I.—OPERATIONS ON OCULAR MUSCLES

van der Hoeve, J. (Leyden).—Operations on the muscles of the eye. (Operationen auf den Augenmuskeln). Graefe-Saemisch Handbuch der gesamten Augenheilk., 2te u. 3te Neubearbeitete Auflage, 1922.

As **van der Hoeve** points out operations on the eye muscles are practically the same thing as squint operations. His contribution on this subject to the new edition of the Graefe-Saemisch handbook amounts to two hundred pages with nearly as many illustrations. In the introduction the relationship of squint to diplopiaphobia (the author's own word) is discussed. Where double vision causes no annoyance, that is, in persons who do not have diplopiaphobia, a static squint occurs which causes no inconvenience and is only cosmetically unpleasant if it reaches a high degree. Persons who have diplopiaphobia and also fusion sense become for practical purposes orthophoric or have a latent squint or, if their efforts are unsuccessful, fall into the group of concomitant squinters together with the diplopiaphobics who have no fusion sense. After referring to the influence of refractive errors, which determine the direction but not the amount of squint, the author points out that squint is the resultant of static, psychic, and sensori-motor factors, and not due to any one of these alone. Operation is a link in the chain of treatment and is greatly assisted by the presence of fusion sense; its results may be functional or only cosmetic according to circumstances. The operations are discussed in two groups, those intended to weaken and those intended to strengthen the action of a muscle. An immense number of different procedures is presented to the reader in encyclopaedic fashion and this part of the work does not lend itself well to abstraction. Of muscle-weakening operations in general

it is stated that in spite of their number no one of them can produce a lasting and calculable effect; they have, nevertheless, and will probably keep, their own field of usefulness either alone or together with muscle-strengthening operations.

To the second class of operation twice as much space is allotted and the last ten pages deal with the indications for muscle operations; whether one or both eyes should be operated on, and if one only, which one; the aim of the squint operation; the age at which it should be performed and the advantages obtained by it. The author on the whole prefers to operate on the deviating eye, in high degrees on both, and in regard to age favours about six years when children first go to school, in order that they may be spared annoyance. Early operation does not predispose to secondary squint. While a little more of the author's personal opinion as to which of the many operations described is the most reliable for the different degrees of deviation would have been acceptable, as an exhaustive review of the operative treatment of squint van der Hoeve's contribution will be heartily welcomed by all ophthalmic surgeons.

H. M. TRAQUAIR.

II.—CATARACT

(1) **Elschnig (Prague).—Extraction of senile cataract in the capsule. (Die Extraction des Altersstares in der Kapsel.)** *Bericht der Deutschen Ophthal. Gesellschaft*, Jena, 1922.

(1) For the past fifteen years at every Ophthalmological Congress of English speaking people, discussions upon the extraction of cataract in the capsule have taken the leading part. German ophthalmologists have not interested themselves in the question. This is somewhat extraordinary, for it was Pagenstecher who perfected the first practical method of intra-capsular extraction. More than 20 years later Gradinego expressed the lens in its capsule by pressure with two spatulae after he had loosened the zonule with a slightly bent hook. Orlando Pes loosened the zonule and withdrew the lens with a double hook. None of these methods came into common use till Smith introduced intra-capsular extraction to English ophthalmologists by an unprecedented campaign backed up by a unique wealth of material (well over 100,000 operations). For nearly three lustra the fight raged, chiefly in America, and it almost appeared that victory would remain with Smith, although some authors who had made the pilgrimage to India, the "Mecca" of intra-capsular extraction, had given extraordinarily contradictory reports regarding the results they saw. **Elschnig**, in 1910, interested himself in the operation, and ten years later Ascher

collected and published his material, 198 Smith's operations. They came to the unanimous conclusion that Smith's operation is indicated when iridectomy had been performed or had to be performed; and should only be completed when it could be performed with reasonable ease. If the lens does not appear during light pressure then the capsule must be opened. In the case of simple extraction it is only justified with a Morgagnian cataract. In all other varieties of cataract it is contra-indicated because of the danger of vitreous prolapse and of the iris prolapse which is consequent to the great trauma to the iris.

It seems to Elschnig that his conclusions are confirmed by the latest reports from America. Smith, during a "propaganda journey" in America, operated by his method in various hospitals upon cases chosen by himself, and we now have four reports upon the results. Zentmeyer, Findley, Fischer and Nobel, give a full report of the results. Among 64 operations there are but 50 good results with visions from 6/6ths to 6/30ths. Three expulsive haemorrhages are noted, and 18 cases of irido-cyclitis, with 10 cases of total blindness or mere perception of light. Vitreous loss was common; in one report, 38 per cent. Iris prolapse and encleisis was present in about 30 per cent. In the light of these statistics, Elschnig considers that he is correct in judging that Smith's operation is unsuitable as the operation of election in non-Indian races.

Stanculeanu's operation has received much less attention. It appears to have been taken up solely in America where Knapp performs a modification thereof. In his first report upon 214 cases, the manoeuvre was successful 89 times, and in the second series, in 50 cases out of 100. Elschnig has performed Knapp's operation 55 times, and in 35 of them without iridectomy. Among the 35 simple operations were 19 in which the capsule burst, in three cases with loss of vitreous. Thirteen were successful with but one loss of vitreous. In two eyes the iris was attached to the wound, and in three the iris prolapsed. The apparent high percentage of success was only attained in some cases by rupturing the capsule when vitreous loss was threatened or when great difficulty was experienced in expressing the lens. The 22 cases with iridectomy were all satisfactory, 12 were removed in the capsule, the remainder after rupture. The conclusion is the same as for Smith's operation. The method is suitable only when combined with iridectomy. Loosening the zonule before expression is a great advance upon Smith's original operation.

Elschnig considers that Barraquer's method is even more dangerous than Smith's. His own observation upon intra-capsular operation has led him to think that the difficulty in extracting in the capsule is not connected with the zonule but with the intimate attachment of the posterior capsule to the hyaloid. Some have even

spoken of a capsulo-hyaloid membrane. There is therefore a danger, even if the suction spoon does not slip and suck in the iris, that the vitreous will be torn out with the lens. This in fact has happened in spite of the favourable statistics claimed by Barraquer, who, nevertheless, admits 6 per cent. of bad results even including cases of total blindness.

Braunberger, who saw Barraquer operate in Paris, reports that he observed several unpleasant complications and points out that Barraquer did not report upon his first 150 operations.

Elschnig concludes with the following questions:

(1) Is extraction in the capsule materially better than the orthodox operation? He answers, no. It is obvious that there can be no difference in the liability to infection, but it would appear that post-operative iritis due to retained cortex is less frequent; the operator, however, is generally able to remove all cortex. In eyes which have suffered from irodocyclitis, the total absence of cortex after the operation is a great advantage, and it is in such that intra-capsular extraction is easiest. The question of after-cataract can be answered in similar fashion. Although Elschnig lays great weight upon good visual acuity, he performs discission only after about 5 per cent. of his extractions, because he partially removes the capsule with capsule forceps. In any case the presence of after-cataract and the possibility of non-infective iritis is not a sufficient argument in favour of intra-capsular extraction if we weigh against it the greatly increased frequence of vitreous loss.

(2) The second question is whether the advantages claimed for intra-capsular extraction outweigh the necessity for iridectomy. He, with practically all modern operators (?), categorically holds that the maintenance of a round pupil is a ***sine qua non*** in extraction and should be aimed for whenever possible, and that the simple operation should be combined with a small basal iridectomy.

T. HARRISON BUTLER.

(2) **Le François (Avranches). — Immediate discission of the posterior lens capsule in operating for cataract. (Discission immédiate de la cristalloïde postérieure dans l'opération de la cataracte.)** *La Clin. Ophtal.*, May, 1919.

(2) **Le François** points out that so long ago as the middle of last century Rivaud-Landrau practised discission of the posterior capsule as part of the operation for cataract extraction, the object being to prevent the formation of secondary cataract. Losses of vitreous were so frequent that the practice was soon abandoned. Le François, however, has revived the operation in cases where the pupil is not black after extraction of the lens, but he has modified the original procedure by cutting a large conjunctival flap and stitching it in position before he attacks the posterior capsule.

The order of the steps of the operation is as follows:—Corneal section with flap, iridectomy (as a rule), passage of the suture from the superior lip of the conjunctival incision, and some fibres of the episclera, to the middle of the corneal flap, discission of the anterior capsule, extraction of the lens, and toilet of the anterior chamber. The suture is now double knotted and, if it be decided to incise the posterior capsule, a cystotome is introduced at the side of the incision and between the lips of the corneal wound. The instrument is carried down to the lower edge of the pupil and one vertical incision in the posterior capsule made from below upwards. The cystotome is then withdrawn. Great care is taken to avoid entanglement in the introduction and withdrawal of the cystotome, and one can imagine that this is the most difficult part of the operation. The suture is usually withdrawn at the first dressing after forty-eight hours. The author admits that there is apt to be a little more reaction than usual, especially if iridectomy is not done. The following are the author's visual results:—V.A. 1 to $\frac{3}{4}$ three times; $\frac{3}{4}$ to $\frac{1}{2}$ twelve times; $\frac{1}{2}$ to $\frac{1}{4}$ fifteen times; V. = 0 three times. Total 33. The three failures are, irido-cyclitis twice, detachment of retina in a myope once. Le François considers that the results are better than would have been the case without posterior discission, but probably most surgeons will consider that 9 per cent. of total failures is too high a price to pay, even admitting that, as Le François says, the operation on the posterior capsule was only done in about 40 per cent. of the cataract cases operated on: 33 out of 80 to be exact.

ERNEST THOMSON.

(3) **Lister, A. E. J., Major I.M.S. (Lucknow, India).—A preliminary note on an investigation as to the actual weight of the cataractous lens, together with some clinical notes on cataract.** *Indian Med. Gazette,* March, 1920.

(3) **Major Lister** gives the weights of 80 cataractous lenses extracted in their capsules in India. The average age of the patients was 56 years.

The most striking feature emphasized in the investigations is the wide variation above and below normal, the heaviest lens (340 mgm.) being more than three times the weight of the lightest (110 mgm.).

Another interesting observation is that the total increase in weight, made up by fluid in the early swollen cataracts, those with glistening sectors and with shallow anterior chamber, practically balances the loss in weight of the over-ripe shrunken cataracts. Thus the average weight of these 80 lenses, 212·43 mgm., is very little below the weight of the normal European lens as given by Priestley Smith. Possibly some allowance should be made for the presumably smaller size of the Indian lens, corresponding with the lower general physique of the Indian. Over-ripe cataracts are, as

is well-known, much more commonly met with in India than in this country. The balance in average weight of cataractous lenses is evidently kept even by the fact that the swollen rapidly developing cataracts are also decidedly commoner in India. There is thus apparently a difference in the average weight of the cataractous lens in India and in temperate climates. Stricker quotes Treacher Collins in a statement that the weight of the cataractous lens is "far below that of the normal."

Reference is made by Major Lister to the tendency to rupture of the capsule of the swollen cataractous lens during intra-capsular extraction, and to the risk of loss of vitreous in removing shrunken over-ripe cataracts, whether by the intra- or extra-capsular method.

H. HERBERT.

(4) **Smith, Henry.—The earliest stage of senile cataract.** *Lancet*, February 4, 1922.

(4) It is to be noted that **Smith's** article deals with the ***earliest*** stage, not merely with the early stage of senile cataract. After pointing out that our knowledge of the causation of cataract is "hardly even in the stage of theory" he reminds us of what he has previously said, namely, that ***failing distant vision*** is the earliest symptom of senile cataract, the corrected near vision remaining good for ordinary purposes when the distant vision is reduced to less than one half. At this point nothing may be observed in the lens further than that it does not transmit light as well as a normal lens. Actual cataractous appearances are unusual unless the vision has been reduced below 6/10. The terms ***mature*** and ***immature*** really refer only to the later stages of cataract, the latter term implying extensive partial opacity of the lens. We now come to Smith's main point which is, that this earliest stage of cataract is often curable. He expressly states that he does not mean that visible sand-like opacities and opaque striae can be made to disappear. He means that when the lens is in the stage of merely being less light-transmitting than normal the progress of the trouble may be checked and a return to normal made. He has found that up to 6/10 he would be successful in almost every case in obtaining a return of 6/6 and maintaining it for years. The method employed consists essentially in inducing hyperaemia. Smith supposes that this hyperaemia re-establishes the physiological condition of the metabolising mechanism. He has thus induced hyperaemia by sub-conjunctival injections of cyanide of mercury (1 in 4,000) or of iodide of potassium (15 to 18 grains to the ounce) or of dionin. Smith refers to his earlier paper (the date is not given, but the reviewer has unearthed it in his files, *Lancet*, April 20, 1912) and states that a number of observers have tried the method, some successfully, others not. He points out that diagnosis must be

carefully made. Failing distant vision from other causes must be considered. He suspects that failures may have been due to mistaken diagnosis.

This short and very suggestive article, which, it must be remembered, is in confirmation of the previous one referred to above and embraces ten years of further experience, ends with the following remark.—"The question of cataract opens up a wide field for the physiologist, and I hope that physiologists will devote more attention to the nutrition of the lens and vitreous than they have done in the past."

ERNEST THOMSON.

(5) **Laas, Rudolf (Frankfurt am Oder).—The beginner's cataract operation. (Die Staroperation des Anfangers.)** *Zeitschr. f. Augenheilk.*, Vol. XLIII, p. 574, 1920.

(5) **Laas** wonders how many cataract extractions the tyro spoils because of technical defects in his operation. He proceeds to suggest a procedure which he considers the safest not only for the unpractised hand but also for the finished expert. One of the most dangerous complications is loss of vitreous. It is therefore necessary to proceed in such wise that this accident will be infrequent, and that its evil effects will be minimized. Infection after loss of vitreous is common and is best avoided by covering the wound with a conjunctival flap. It is impossible to fashion this flap after loss has taken place because any further manoeuvre is accompanied by renewed flow of vitreous. Therefore, in every extraction Laas cuts a double pedicled flap by the Kuhnt method from the conjunctiva above the cornea. Two sutures are now passed, one temporal and the other nasal, which can be drawn tight the moment danger threatens. This flap is more easily cut after the sub-conjunctival injection of a 2 per cent. solution of novocain to which a few drops of adrenalin have been added. After the injection a few drops of a 1 per cent. solution of pilocarpine are instilled to prevent dilatation of the pupil.

Laas points out the great difficulty of removing these sutures. It must be done under the best artificial light with the aid of a Berger's loupe.

Graefe's knife is in the hands of the beginner a double-edged weapon; it is for all difficult to use. Why do so? Instead, he employs a broad keratome and enlarges the wound at both extremities with a pair of sharp curved scissors. The anterior capsule must be pricked with the point of the keratome.

The subsequent stages of the operation are those common to all extractions. When the lens has been removed the sutures are drawn tight and the wound sealed by the flap.

Laas thinks that it is a mistake to operate without adequate magnification, so he uses Berger's loupe. The field of operation is

brightly illuminated by a Nernst lamp and a projecting apparatus placed at the side.

No assistant is necessary, as whereas these are often clumsy, the young operator is recommended to accustom himself to operate alone. We think that few, if any, surgeons, will endorse the advice Laas offers to beginners. To us it seems thoroughly bad. The normal operation with Graefe knife is but a matter of seconds and whether performed with or without a conjunctival flap leaves a clean linear wound that heals quickly and smoothly. The incision suggested is clumsy and irregular. The double pedicled flap is a messy addition, which takes time and is wholly unnecessary. If a conjunctival covering is wanted the orthodox method gives one, or the lens can be removed under a conjunctival bridge. To operate with a Berger's loupe must cramp the style and prevents that all round view which is so necessary to anticipate any fortuitous movement of the patient. A presbyopic operator should wear suitable spectacles, preferably bifocal. The time taken in all these preparations is time lost during which an otherwise docile patient may lose self control and become impossible, in which case the flap will not prevent but actually encourage loss of vitreous.

T. HARRISON BUTLER.

(6) **Arana. — Cataract following electric shock. (Cataratas electricas.)** *Arch. de Oftal. Hisp.-Amer.*, June, 1918.

(6) The author records an example of cataract following an electric shock, the intensity of which was equal to 20,000 volts. Several severe burns were occasioned in the palm of the hand, lumbar region and side of the neck, from the last of which a severe secondary haemorrhage occurred as the sloughs separated, which necessitated ligature of the inferior thyroid artery. A perforation of the trachea formed subsequently as a result of further separation of sloughs, but eventually the wounds healed and the man was discharged.

Four months after the accident the man returned complaining of misty vision; this mistiness rapidly increased, and he was transferred to the care of Pacheco Luna, of Guatemala, who found a mature cataract in each eye. A simple extraction with suture of the cornea (Kalt's method) was performed on each eye, an interval of nine days occurring between the two operations. The result appears to have been most satisfactory.

R. R. JAMES.

(7) **Schanz, Dr. F. (Dresden).—On the development of presbyopia and senile cataract. (Weiteres über die Enstehung der Weitsichtigkeit und Altersstars.)** *Arch. f. Ophthal.*, Vol. LXXXIX, Part iii, 1916.

(7) **Schanz**, who in association with Stockhausen has published several previous papers on the effect of light of varying wave lengths

in the eye, in the present communication considers some recent experimental work of Chalupecky on the action of the quartz light on lens albumen. As the original is not available (*Wiener klin. Wochenschr.* Nr. 27, 1914), Schanz's account may prove of interest. Briefly he found that the effect of prolonged exposure of lens albumen obtained from pigs eyes to the light of a quartz lamp resulted in the conversion of the more soluble albumens into less soluble ones and finally into coagulated albumen. A staining reaction obtained with a solution of nitroprusside to which some sal ammoniac had been added (the proportions are not given in the paper), resulted in the red staining of easily soluble albumen. He found that the lenses of young animals stained completely while those of old animals only stained at the margins. An exposure of three hours to the quartz lamp was sufficient to cause the young lens to stain like an old one. He then repeated his experiments with live guinea pigs. Three animals were exposed to the light for seven hours. One was killed immediately and the lens found to stain a light yellow in the centre, then followed a layer which did not stain at all and the periphery stained red. In the other two animals marked electric ophthalmia followed. This was especially the case in one of them, an albino, in which also the other changes to be noted were more conspicuous. These consisted in corneal haze and some lental opacity. The albino was killed 40 days later and the lens found to stain in the same way as that of the animal killed immediately after the experiment. The other animal was killed 70 days after the experiment. The lental opacity had now largely disappeared and the lens stained practically all over, though careful observation could detect a slight difference between the intensity of the stain in the centre and periphery. As Schanz points out the younger the animal the more difficult it is to produce definite visible lental opacity, since the first action of the light is to produce a less soluble albumen which, however, is transparent, and this has to be converted into coagulated albumen before it becomes visible as an opacity. This accounts for the difficulty experienced by previous experimenters in producing a visible change. Schanz points out that short length light waves penetrate to different depths in the tissue in proportion to their wave length. Those waves that are not completely absorbed or diffused in their passage through the lens are reflected back to the centre and in so far as they may reach the anterior surface are once more reflected back. Thus the centre of the lens naturally suffers most. The spectrum of the quartz lamp is not continuous but is a band spectrum in which certain bands are of special intensity. It is, therefore, to be presumed that the rays from these more intense bands will have a specially intense action.

The observation of Chalupecky that the lens opacity cleared up in the animal that was kept for 70 days is in accordance with what

we know of cataract caused by lightning. This is explained as due to the fact that the lens has no vessels and is poor in cell structure, consequently the light irritation does not set up any inflammatory change.

Schanz, in the light of these experiments, discusses the effects of ultra-violet rays on the human eye. As the lens gets older more of these rays are absorbed by it till at the age of 50 the absorption is complete. Now the rays that interest us in Chalupecky's experiments must also be present in daylight. The quartz light contains rays up to 220$\mu\mu$, but, since all rays of a shorter length than 300$\mu\mu$, and most of 320$\mu\mu$ are absorbed by the cornea, any effects produced on the lens cannot be due to rays of a length below this. It is, of course, impossible to expose the human eye to direct sunlight for several hours, but Schanz suggests that the repeated dazzlings that every eye undergoes during life may result in a cumulative effect.

Schanz adds some account of observations of his own on the effect of various wave length light on other albumens and suggests that widespread alterations in living cell structure may follow the alteration in the solubilities of albumen that can be produced in this way.

E.E.H.

(8) **Marzolph (Breslau).—The influence of the wearing of cataract glasses on earning capacity. (Ueber den Einfluss des Tragens von Starbrillen auf die Erwerbsfähigkeit.)** *Klin. Monatsbl. f. Augenheilk.*, p. 488, Nov.-Dec., 1915.

(8) **Marzolph** examined the records of 51 cases of cataract operation in which the following conditions were fulfilled:

1. The aphakia must be due to an operation for cataract.
2. Either both eyes must have been operated on or, if one only, the other must have no useful vision.
3. Cataract glasses must be worn during work.
4. The general health must be adequate.

It was found that workers who had been operated on for cataract and wore cataract glasses, were, generally speaking, still in a position to earn good wages. In agriculture the same wages could be earned as by normal persons. In some other cases although full earnings could not be reached the legally fixed minimum for the trade could always be exceeded. The existence of a desire and intention to work is of much greater importance than the visual acuity attained. In estimating the earning capacity the objective findings in the eyes and the visual acuity obtained with glasses constitute the sole criterion; statements by the patient and reports from others are only of value when they agree with the objective findings.

H. M. TRAQUAIR.

III.—TOXIC AMBLYOPIA

(1) **Sattler, Prof. Dr. C. H.—Contributions to the clinical picture of tobacco-alcohol amblyopia.** *Klin. Monatsbl. f. Augenheilk.*, April, 1923.

(1) The following findings are recorded, 30 patients having been examined.

1. *Pupils.* It is asserted in the literature that in nicotine poisoning the pupils should be narrow, and in alcohol poisoning, wide. According to Reisch, interference with the pupillo-motor area of the retina—as occurs in retro-bulbar neuritis—should shorten the duration of the contraction to light. Twenty patients with a well-marked central visual disturbance from tobacco-alcohol amblyopia showed no deviation from the normal, and in the whole 30, the findings were negative with regard to changes in diameter, contour or reaction of the pupils. The velocity of the reaction was also unaffected.

2. *Light Sense.* Examined by Birch Hirschfield's adaptometer.

(*a*) Twelve out of 16 cases gave the normal threshold and showed a normal course of adaptation, though their vision was reduced to 1/12.

(*b*) In three cases the adaptation was diminished to 1/2 or 1/4 of the normal.

(*c*) In one case the threshold was 1/20 of the normal, and the sensibility after twenty minutes adaptation, 1/100.

This was the only patient of the 30 who could see better by twilight. The remainder showed improvement in visual acuity when looking through smoked glass which reduced normal visual acuity to 1/2.

Igersheimer found two cases out of ten with defective light sense, three with partial disturbance, and five normal—Pick, all normal. This is explained by the absence of rods from the defective central area of retina.

Uhthoff's 25 per cent. of conjunctival xerosis and hemeralopia in severe chronic alcoholism were found to be due mainly to the gastric and hepatic sequelae of alcoholism.

3. *Fields* were taken in 26 cases, with discs from 2—15 mm. diameter at 0.5—2 metres distance from a smooth, black wall, several control examinations being made with each patient.

(*a*) In 13 cases the central point of maximum density of the scotoma lay between the fixation point and the blind spot. Dividing this distance into macular, middle and papillary thirds, the centre lay three times in the macular third, three times in the middle third, twice in the papillary third, and three times it stretched from the blind spot to the middle third. In this group of 13 cases, the average vision was 1/3.

(*b*) In 13 cases the centre covered the fixation point and the scotoma filled principally the macular third, and the average vision was 1/12.

(*c*) In four cases the central defect for red communicated upwards, and nasally with the peripheral red blind area.

(*d*) The periphery of the field was always normal.

(*e*) During recovery, the blue scotoma disappeared before the red, except in one case. The scotoma in one case moved gradually to the fixation point, in two others, back to the blind spot, in another it divided, leaving one on the fixation point, and one on the blind spot.

Taking the above phenomena into account, together with the three types of scotoma described by P. G. Doyne in this Journal last year, one is justified in stating that the term "central scotoma" is incorrect, since in many cases of tobacco-alcohol amblyopia, the centre of the scotoma is not at the fixation point. Also, one must abandon Edinger's hypothesis that the fibres with the highest function and most active metabolism are the first to be attacked.

von Igersheimer and others have also emphasized the variability in size of that portion of the papillo-macular bundle which is found anatomically to be degenerate in this form of amblyopia.

F. A. WILLIAMSON-NOBLE.

(2) **Fradkine.—Toxic amblyopia of alcoholic origin. (Amblyopie toxique d'origine alcoolique (alcool denaturé, eau de Cologne, etc.)** *La Clin. Ophtal.*, July, 1919.

(2) **Fradkine's** article appears to be in the nature of an abstract of a communication by a Russian ophthalmologist, Jacovleff, but the source is not stated. The following may be gleaned from it.

The Russian peasant, suddenly deprived of ordinary alcohol, turned to eau de Cologne, denatured alcohol (? methylated spirit), camphorated alcohol, and even varnish; in this last the resinous matter is precipitated by addition of water. Of 30,750 patients (presumably eye patients in general) seen during nine months 80 were affected with partial or total toxic amblyopia (70 males, 5 females) caused by eau de Cologne, etc. As a final result there was complete bilateral blindness in six cases, and complete monolateral blindness in two cases. Perception of light returned in one or both eyes in six cases. Preservation of vision of less than 1/10th in 36 cases, and more than 1/10th in 10 cases. Monocular retention of vision more than 1/10th in 18 cases. Later on even these acuities may not be maintained. The most potent of all the alcohol substitutes appears to be eau de Cologne, which contains a very large amount of methyl alcohol. The symptons of poisoning are those of methyl alcohol, namely vomiting, general malaise, asthenia, headache, vertigo and constipation. As eye symptoms there are mydriasis,

loss of light reflexes, and amblyopia in three or four days. Nothing is found ophthalmoscopically on the first day. After two or three days the disc is veiled and woolly (*flou*), its edges blend with the retina; the veins are over full and the arteries restricted. From the 15th to the 30th day the disc passes through the various stages to complete atrophy, and now, in the macular region are found small greyish yellow patches which complete the clinical picture. The exact pathological lesion does not seem to be as yet quite certain, some considering that there is an interstitial neuritis, others that the retinal ganglion cells are first affected and the nerve secondarily

ERNEST THOMSON.

(3) **Uhthoff (Breslau.)—Contribution to the visual disturbances due to poisoning by methyl-alcohol. (Beitrag zu den Sehstörungen durch Methylalkohol-Vergiftung.)** *Klin. Monatsbl, f. Augenheilk.*, Vol. LIV, p. 48, 1915.

(3) About 200 men drank methyl-alcohol in mistake for brandy and of these 50 suffered from severe general poisoning. Two regular drinkers had remained well in spite of considerable indulgence in the poisonous spirit. Twelve died and it could not be ascertained whether they had suffered from visual symptoms. Of the remaining 38, two showed severe visual disturbance amounting to blindness, six had small central colour scotomata, while almost all the remainder showed temporary loss of sight with normal fundi. In one case there was pain on moving the eyeball associated with marked loss of vision. Definite muscle paralysis was not observed, but one case showed slight inhibition of movement to the right side and in five there were nystagmus-like twitchings when the eyes were in extreme lateral positions. Two cases are described in detail with charts of the fields of vision showing various field defects always involving the central area. The prognosis is doubtful even if improvement occurs at first, and the treatment consists in diaphoresis with electric light baths, strychnine, iodide of potash and nourishing diet.

H. M. TRAQUAIR.

BOOK NOTICES

Official History of the War. Medical Services: Surgery of the War, Vol. II. **Medical Services: Hygiene of the War,** Vol. II. Printed and Published by His Majesty's Stationery Office. 1922.

Chapter XV of the volume on the surgery of the war is devoted to injuries and affections of the eye. The greater part has been written by Col. Sir William Lister, A.M.S., Consulting Ophthalmic Surgeon to the British Expeditionary Force in France. The

section on "Wounds and Intra-ocular Foreign Bodies" is the work of Capt C. B. Goulden, R.A.M.C. (T.), who was Ophthalmic Specialist in charge at Rouen. The section on "Ophthalmic Work in Macedonia," is from the pen of Major C. H. Usher, R.A.M.C. (T.), Ophthalmic Specialist, Salonika Expeditionary Force, and that on "Ophthalmic Work in Egypt" is by Lt.-Col. H. L. Eason, R.A.M.C. (T.), Consulting Ophthalmic Surgeon, Forces in Mediterranean and Egypt.

The 53 pages of this chapter contain a clear, but owing probably to the exigencies of space, a concentrated account of the elaborate organization and the conduct of the ophthalmic section of the Army Medical Services; it enables the reader to form some idea of the ceaseless activity of those in charge and of the immense amount of work and responsibility which devolved upon them. The earlier part of the chapter in which Sir William Lister describes the methods of organization is full of interest; it shows the evolution from very modest beginnings of "Ophthalmic Departments" (an entirely new feature in our army on active service) which eventually reached a degree of completeness and thoroughness, redounding to the credit of the Army Medical Service, and to the organizing ability of the Consulting Ophthalmic Surgeon.

The more purely medical sections deal with "Injuries and Affections of the Eye on the West Front," "Concussion Injuries," "Wounds," "Functional Disorders," "Affections due to Disease," "Injuries due to Gas Warfare."

Concussion injuries are dealt with very briefly, only three pages being allotted to them. They occurred with such frequency, and their clinical and pathological character were so varied and interesting, and in many instances novel, that a longer and more detailed account would, we think, have been justified, and, certainly, welcomed by readers.

The statements concerning lesions alleged to be due to "windage" are important and deserve notice. The experience of British Ophthalmic Specialists lends no support to the view that windage is a cause of neuritis, retinitis, rupture of the choroid, etc. "In every case where there was ophthalmoscopic change definite evidence of injury by a foreign body was found."

The number of cases of perforating wound and intraocular foreign bodies was very large. In his report Capt. Goulden deals chiefly with the methods and means of treating these cases. The disadvantages of a stationary magnet led to the introduction of a mobile magnet, mounted in a motor ambulance, and also of a portable magnet designed at the Imperial College of Science. These two useful additions to the equipment of the Ophthalmic Department are described by Capt. Goulden. The immediate

results of extraction of foreign bodies by the magnet "were not so good as those following similar accidents in civil life," and unfortunately, the final results were generally unobtainable. Some remarkably good results were obtained, in which useful vision was retained for many months after operation, and in the majority of cases an eye with damaged sight was saved.

The remarkable freedom from sympathetic ophthalmitis is an arresting fact. In the Franco-Prussian War of 1870-71 it is reported that in the Prussian Army this disease occurred in 55.6 per cent of ocular injuries. In our Army in France "out of a thousand cases of intraocular injuries only one definite case of sympathetic ophthalmitis is known though there may have been cases in which the disease developed at a later date." This almost complete immunity from this dread disease is attributed to: (1) the antiseptic precautions taken in all ophthalmic operations; (2) the care with which prolapse or entanglement of uvea in penetrating wounds was excised, and (3) the prompt and thorough removal of useless dangerous eyes including those which had been shattered by rupture.

Among functional disorders, night blindness was fairly common; in most of those complaining of this defect no disease or abnormality could be found. The condition in the majority was partial and "should probably be looked upon as one of neurasthenia which picked out those who had originally poor acuity in low illumination."

Cases of ocular injury due to gas employed by the enemy were numerous. In about 90 per cent no permanent damage to the cornea ensued; 10 per cent of the cases were severe and the cornea suffered more or less seriously. An instructive account of such cases is given, illustrated by excellent coloured drawings, and some photo-micrographs, showing the changes induced in the corneal stroma and in its anterior epithelium. These serious and permanent lesions were caused by mustard gas (dichlor-ethyl-sulphide).

Lt.-Col. Eason's report of ophthalmic work in Egypt contains the gratifying information that in spite of the prevalence of trachoma in the native population and in the Egyptian labour corps, only 342 cases in the British troops were reported in three years. Only 68 cases were recent and of these, as of the chronic variety, a high proportion occurred among the Australian troops. In view of the fact that for three years our army lived in a country in which trachoma is "almost universal," that it had been "working side by side with the Egyptian labour corps, almost all infected with trachoma, that native servants had been employed . . . . and that hospitals had been largely staffed by native orderlies,"

this freedom from trachoma is a tribute "to the high standard of cleanliness and sanitation maintained."

Major Usher states that the chief interest of ophthalmic work in Macedonia concerns retinal haemorrhage and keratitis in connection with malaria. Haemorrhage was found in 18 eyes of 13 men with malaria; subhyaloid haemorrhage at the macula was present in ten eyes of eight men; other forms were usually small and flame shaped and all occurred at the macula or close to the optic disc.

Examination of the blood seemed to show that in a large proportion of the cases the haemorrhage is a result of the anaemia secondary to malaria. Keratitis was by far the most common ocular manifestation in malaria, and varied considerably in its characters. Dendritic keratitis was not infrequent and proved intractable, "most men remaining between four or five weeks at the base centre." Quinine amblyopia was not of frequent occurrence, in view of the large quantities of the drug administered in many cases of malaria. Some 22 cases were seen by Usher in British troops.

Sir William Lister's contribution to the volume of Hygiene of the War is Chapter XV on the "Prevention of Trachoma." In it he gives a vivid account of the struggle to confine the disease to men of the labour battalions, to prevent its spread to the British troops and the French population, and to deal curatively on a large scale with the subjects of it. The remarkable success obtained reflects great credit on the medical services.

The disease was discovered among the coolies in France, first in the Egyptian and later in the Chinese companies. Immediate steps were taken to prevent as far as possible the introduction of further cases into France, and to organize segregation and treatment for those already in the country.

The methods adopted are described in detail and should be studied by all. That the results were eminently satisfactory is obvious from the following statement:—"In a report drawn up after fifteen months of experience it was stated that though there had been some 8,500 cases of acute infectious trachoma, 5,500 cases of suspicious conjunctivitis, and 86,000 contact cases, the disease was diminishing, the individual cases were greatly improved, no instance was reported of the disease having spread . . . . to the British troops or the French population, and the number of men off duty for eye trouble was from 0.25 to 0.9 per cent."

It may justly be said that no greater services were rendered to the Army by the personnel of the ophthalmic section of the medical services in France than those by which the fighting battalions were kept free from the scourge of trachoma.

Operative Treatment of Glaucoma. By H. HERBERT, F.R.C.S. London: Baillière, Tindall & Cox. Price 10s. 6d. 1923.

Described by its author as a *résumé* of papers already published, worked into a revised and connected whole, this book would have proved more useful if the revision had been more complete and the connection more obvious. This is not to deny the obvious advantages which must result in elucidating a subject which has received much helpful consideration by the author by publishing the results of his labours in a single volume. We have always been of opinion that Herbert's small flap sclerotomy was an operation which has a valuable place in the treatment of glaucoma. We are glad to know that many surgeons, in this country at least, still employ it in suitable cases, and it was long before the reviewer replaced it in general use, by the trephining operation —there is still a place for Herbert's operation, and we believe that it would have held its own better if its originator had been more precise in his description of its best method of performance, and more consistent in his advocacy of it in its final form. In the present volume Herbert is claiming the advantages of his iris inclusion methods; but when it is necessary to refer to three different chapters in order to glean all his observations upon any particular operation, it seems likely that few will be convinced of the advantages of a method which ophthalmic surgeons will approach with some hesitancy and diffidence. This is not to deny that Herbert may have produced results by his iris inclusion operation which would confound his critics. Had the book been arranged in better sequence, and the operations advocated been more clearly described, with a clearer indication of the author's views as to when any one of them should be selected, it would, in our opinion, have been of more general service. Admittedly, while the whole subject of the operative treatment of glaucoma is in a state of flux, we may be asking for more than the author, pioneer as he is, may be prepared to give us. As a guide for those still searching for the ideal glaucoma operation the book is particularly welcome, and cannot fail to be of service.

CORRESPONDENCE

BUTYN VERSUS COCAIN

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

SIR,—The appointment by the Home Office and Ministry of Health of a Committee of Investigation regarding substitutes for cocain will receive the whole-hearted support of the profession.

Cocain, as a local anaesthetic, has not many faults, either when used in general surgery or in some special branch thereof, but occasionally there are disagreeable symptoms when used by the infiltration method. If the use of cocain could be confined to legitimate surgical purposes within the limits of its anaesthetic capacity no one would wish to find a substitute. But it cannot be so confined. Cocain is rampant in the land and the strictest supervision has failed to control it. The public conscience is strongly roused, and there is an outcry for the international suppression of the illicit use of a drug which is sapping the moral and physical well-being of the world.

We must accept things as they are and find a means of stopping the plague altogether. But a root-and-branch policy cannot be made effective until an equally good substitute, which is absolutely innocuous, is available. Of those which have been long in use, novocain, stovain, alypin, and others, not one has been able to compete with cocain for general use. Each has its merits in specific cases, but their action is limited and they can never challenge the supremacy of cocain. In ophthalmology, for instance, none can satisfactorily replace cocain in operations for cataract and glaucoma. In laryngology there is also a similar limitation.

During the last year the new substitute—butyn—has arisen and challenges cocain in all the spheres dominated by that drug.

As yet it has not been subjected to the fiery furnace of criticism. Its claims are great, and if it can substantiate them it should go far to shake the foundations of cocain.

But thorough and prolonged clinical experience alone can decide what the final result will be. At present its value in dentistry seems to be undoubted. In ophthalmology it is quite satisfactory for all operative work which has previously been carried out under cocain anaesthesia. In America, butyn has been extensively used with very satisfactory results. In India it is reported to be quite satisfactory for cataract operations by Major Dickson.* But more experience not only by ophthalmic surgeons but also by laryngologists is urgently required.

Yours faithfully,

BATH. W. M. BEAUMONT.

MINERS' NYSTAGMUS

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

SIR,—Under the heading The Aetiology of Miners' Nystagmus in the July number, I see a reference to my two communications to the *British Medical Journal* (May 5, June 9).

*BRITISH JOURNAL OF OPHTHALMOLOGY, p. 575, 1922.

The object of both of these notes is to contest the validity of the claim that deficient illumination is the essential factor in the production of miners' nystagmus.

It should be noted also that the cases of nystagmus quoted are those arising in the year 1922.

Clearly, if deficiency of light were the essential factor, the percentage of nystagmus among the hewers should be very nearly equal to that among the other underground workers.

Further, on June 9 I gave the only evidence I could obtain of pits that were or had been using electric light only; electric light in these pits was associated with a great increase of nystagmus.

Therefore, in all the pits in the North, of which I have detailed information, the evidence is conclusive, and is opposed to the conclusions of the Miners' Nystagmus Committee.

My own view is that the disease only occurs in those who have a congenital pre-disposition to it; and that it is chiefly found amongst coal-hewers, and that deficiency of illumination is a negligible factor in its causation.

The last two points I have proved in those pits in the North.

Yours truly,

NEWCASTLE-ON-TYNE. A. S. PERCIVAL.

OPERATIONS FOR CHRONIC GLAUCOMA

To the Editor of THE BRITISH JOURNAL OF OPHTHALMOLOGY

SIR,—I believe that the reason why a bleb forms after sclero-corneal trephining in some cases and not in others may be due to the fact that some glaucomas require much freer drainage than others.

I agree with Lt.-Col. H. Herbert (*Operative Treatment of Glaucoma*, 1923), that chronic glaucomas may be divided into two classes: (1) Where very little drainage only is necessary to restore the balance; (2) others in which only free drainage will effect this result. Iridectomy is probably only successful in No. 1, and, in my opinion, only then when a piece of iris happens to be left in the wound which acts as a drain—in other words "Iris inclusion." In nearly all cases of success after iridectomy careful examination with a high power will detect iris inclusion. It often happens that after sclero-corneal trephining the conjunctiva over the trephine opening becomes opaque, almost completely obscuring the hole, but pitting of the conjunctiva is well marked. On the other hand, if the case is in Class 2, then a bleb, more or less in size will form, due not, I believe, to the method of operation, but entirely caused by the amount of fluid which has to drain away. In these cases iris inclusion would most certainly

fail, only a free, permanent fistulous opening will be successful. If my conclusions are correct, sclero-corneal trephining is perfectly satisfactory in Class 1, and is the only operation which can succeed in Class 2. A few cases occur in which it appears almost impossible by any operation to keep the tension down.

After many years of practice I have come to the conclusion that if chronic glaucoma is present only one line of treatment should be adopted—operation: and that operation should be sclero-corneal trephining.

Yours faithfully,

HOVE, SUSSEX. H. H. TAYLOR.

NOTES

Appointments

SIR J. HERBERT PARSONS, Mr. L. H. WILLOUGHBY LYLE, and Mr. MALCOLM L. HEPBURN, have been appointed examiners in ophthalmic medicine and surgery by the Council of the Royal College of Surgeons of England.

Messrs. F. C. CRAWLEY and R. D. JOYCE have been appointed examiners in ophthalmology by the Royal College of Surgeons in Ireland.

Mr. T. M. BRIDE has been appointed clinical lecturer in ophthalmology to the University of Manchester.

CAPTAIN W. H. KIEP has been appointed ophthalmic surgeon to the Royal Eye and Ear Hospital, Bradford.

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Council of the Royal College of Surgeons of England

OPHTHALMIC surgeons will be glad to know that at the recent annual election to the Council of the Royal College of Surgeons of England, one of their number, Mr. JOHN HERBERT FISHER, was elected.

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Dr. H. V. Wurdemann

Dr. HARRY VANDERBILT WURDEMANN, *of* Seattle, associate editor of the *American Journal of Ophthalmology*, on June 6, in Washington, D.C., was awarded the honorary degree of Doctor of Science by George Washington University, from which he graduated in 1888.

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A new Scandinavian Journal

A NEW journal, *Acta Ophthalmologica*, will appear this month in Copenhagen, edited by Dr. K. K. K. LUNDSGAARD, who will be helped by correspodents in Lund, Helsingfors, Christiania, Copenhagen, and Upsala. The journal will be published in English, French, and German.